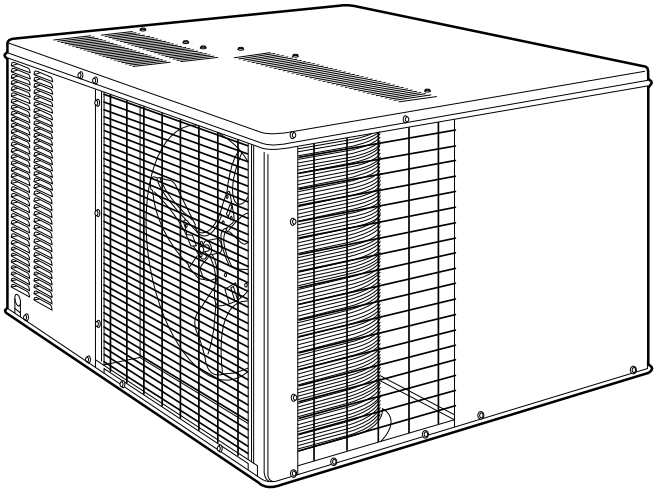
Carrier®

Product Data

50SS Single-Package Cooling Units

1½ to 5 Nominal Tons

COMMERCIAL UNITARY SYSTEMS



Single-Package Cooling Unit for Manufactured Housing/Residential and Light Commercial use.

Features/Benefits

One-piece cooling units with optional electric heaters, low installation costs, dependable, performance, and easy maintenance

Easy installation

Factory-assembled package is a compact, fully self-contained, electric cooling unit that is prewired, prepiped, and precharged for minimum installation expense.

50SS units are available in a variety of standard cooling sizes with voltage options to meet residential and light commercial requirements. Unit installs easily on a rooftop or a ground-level pad.

Convertible duct configuration on the 50SS is designed for easy use in either downflow or horizontal discharge applications.

Efficient operation

High-efficiency design with SEERs (Seasonal Energy Efficiency Ratios) of 10.0.

Durable, dependable components

Compressors are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Vibration isolation provides quiet operation. Rotary, reciprocating, or scroll compressors are used. Compressors have internal high-pressure and overcurrent protection.

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Direct-drive multispeed, PSC (permanent split capacitor) blower motor is standard on all models.

Direct-drive, PSC condenser-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40 F.

Refrigerant system is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

Evaporator and condenser coils are computer-designed for optimum heat transfer and cooling efficiency. Condenser coil is fabricated of copper tube and aluminum fins and is located inside the unit to protect against damage and ensure long life and reliable operation. The condenser coil is internally mounted and protected by a composite grille.

Copper fin coils are also available by special order. These coils are recommended in applications where aluminum fins are likely to be destroyed due to corrosion. Ideal for seacoast applications.

Weatherized cabinets are constructed of heavy-duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the evaporator compartment are insulated with foil-faced fiberglass to help keep the conditioned air from being affected by the outdoor ambient temperature and to provide improved air quality. Unit insulation conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) No. 62P. Sloped condenser pan permits an external drain.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 7.4 bels.

Easy to service cabinets provide easy accessibility to serviceable components during installation and maintenance. Rounded corners are an importportant safety feature. A high-quality finish ensures an attractive appearance.

Optional base rails provide holes for rigging and handling as well as an elevated mounting frame that gives additional support to horizontal installations.

Round duct connections provide easy installation for manufactured housing.

Compact size enables the unit to be located where space is limited.

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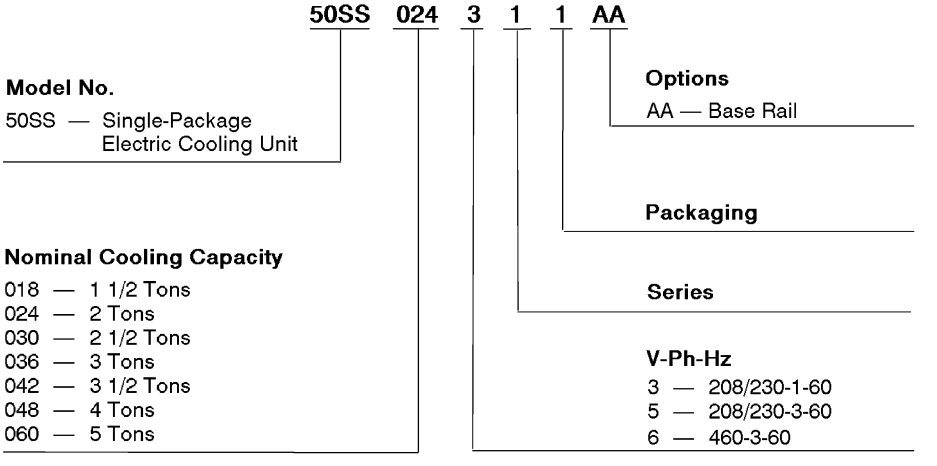
Model number nomenclature



ARI* capacities

UNIT 50SS	NOMINAL TONS	STANDARD CFM	NET COOLING† CAPACITIES (Btuh)	SEER**	SOUND RATINGS†† (Bels)
018	1½	600	17,000	10.0	7.4
024	2	800	24,000	10.0	7.6
030	2½	1000	29,200	10.0	8.0
036	3	1200	36,000	10.0	8.0
042	3½	1400	42,000	10.0	8.2
048	4	1600	47,000	10.0	8.2
060	5	1995	59,500	10.0	8.2

LEGEND

db — dry bulb
Bels — Sound Levels (1 bel = 10 decibels)
SEER — Seasonal Energy Efficiency Ratio
wb — wet bulb

*Air Conditioning and Refrigeration Institute.
†Rated in accordance with U.S. Government DOE (Department of Energy) test procedures and/or ARI Standard 210/240-89.
**All units have factory-installed time-delay relay.
††Rated in accordance with ARI Standard 270-84.

NOTE: Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on 80 F db, 67 F wb indoor entering-air temperature and 95 F db air entering outdoor unit.

OUTDOOR SOUND: ONE-THIRD OCTAVE BAND DATA — DECIBELS

UNIT	50SS						
Frequency (Hz)	**018**	**024**	**030**	**036**	**042**	**048**	**060**
63	49.8	38.1	45.7	47.8	45.5	56.0	54.3
125	56.5	55.0	58.1	59.3	61.2	65.6	65.1
250	60.3	65.3	68.7	67.4	70.4	71.5	71.5
500	59.8	67.2	64.7	68.8	69.9	71.4	72.7
1000	64.1	68.9	73.0	73.1	76.5	74.2	73.9
2000	64.1	65.5	70.2	69.5	71.3	73.3	73.4
4000	65.2	63.8	68.8	68.2	73.7	69.6	71.7
8000	56.0	60.3	66.6	65.8	65.5	67.1	66.3

Physical data

UNIT 50SS	018	024	030	036	042	048	060
REFRIGERANT	R-22						
Metering Device	Acutrol™ System						
Charge	2.60	2.75	3.40	4.30	5.20	6.50	7.00
OPERATING WEIGHT (lb)							
Without Base Rails	208	237	254	270	300	332	359
With Optional Base Rails	228	257	274	290	320	352	379
COMPRESSOR TYPE	Rotary	Reciprocating	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll
INDOOR FAN	Centrifugal — Direct Drive						
Speeds	2	3	3	3	2	2	2
Nominal Rpm	825	1075	1075	1100	1100	1100	1100
Diameter (in.)	10	10	10	10	10	10	10
Width (in.)	9	9	9	9	9	9	9
Nominal Airflow (Cfm)	600	800	1000	1200	1400	1600	1995
Motor Hp	¼	¼	¼	½	¾	¾	1
INDOOR COIL							
Rows...Fins/in.	3...15	3...15	3...15	3...15	3...15	3...15	4...15
Face Area (sq ft)	1.83	2.29	2.29	3.06	3.60	4.44	4.44
OUTDOOR FAN	Propeller — Direct Drive						
Cfm	1700	1700	1900	1900	1900	2400	2400
Nominal Rpm	850	850	1050	1050	1050	1050	1050
Diameter (in.)	18	18	18	18	18	20	20
Motor Hp	⅛	⅛	¼	¼	¼	⅓	⅓
OUTDOOR COIL							
Rows...Fins/in.	1...17	1...17	2...17	2...17	2...17	2...17	2...17
Face Area (sq ft)	5.95	5.95	5.95	5.95	7.00	8.66	8.66
FILTER SIZE (in.)*							
Throwaway	20x20	20x20	20x24	20x24	24x24	24x30	24x30

*Recommended field-supplied filters are 1 in. thick.

Options and accessories

Options

Unit with base rail provides holes for rigging and handling unit; frame provides elevation and support for horizontal applications.

Accessories

ACCESSORY	
Roof Curb	8 in.
	11 in.
	14 in.
Pitched Roof Curb*	1:12
	2:12
	3:12
	4:12
	5:12
	6:12
Modulating Economizer, Downflow	
Modulating Economizer, Horizontal	
Two-Position Damper	
Manual Outdoor-Air Damper	
Filter Rack	
Duct Cover Kit	
Lifting Bracket Kit	
Rectangular Duct Connection Kit	
Outdoor Thermostat	
Crankcase Heater (230-1-60)	
Thermostat and Subbase	
Electronic Programmable Thermostat	
Low-Pressure Switch Kit	
High-Pressure Switch Kit	
Time Guard® II Kit	
Low-Ambient Kit	
Electric Heat with Single-Point Kit (5.0 to 20.0 kW)	

*Ratio of amount of pitch to length of roof.

Factory-assembled roof curbs are designed for use on downflow discharge applications. Heavy gage, galvanized steel construction provides one-piece support. The curb complies with the standards of the NRCA (National Roofing Contractors Association). A wood nailing strip is provided for attaching the roofing to the curb.

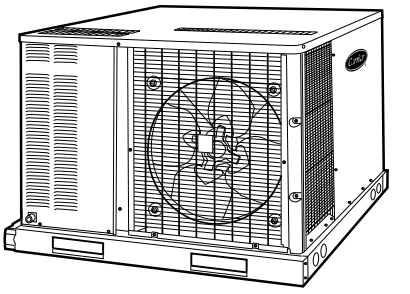
Modulating economizer is available for downflow or horizontal discharge applications.

The economizer adjusts its outdoor- and return-air dampers to economically blend cooler outdoor air with warmer return air for comfort cooling. This process reduces energy costs and extends equipment life by allowing the use of outdoor air to supply ''free'' cooling when conditions are favorable.

Modulating economizer has a mixed-air controller that provides for full-range modulation of the outdoor- and return-air dampers. The enthalpy control selects the suitable outdoor-air quality for ''free'' cooling operation by measuring the outdoor-air dry bulb temperature and humidity mix. Modulating economizer also has an adjustable, motor-mounted, minimum-position potentiometer and a compressor lockout switch. The motor operates through the unit 24-v low-voltage control circuit.

Constant ventilation is recommended for light commercial application when the conditioned space is occupied.

UNIT WITH OPTIONAL BASE RAIL



Manual outdoor-air damper provides for minimum outdoor air and is manually adjustable.

2-position damper allows outside air to enter the building when the indoor fan is energized. When enthalpy control detects that outside air is suitable for cooling, outdoor-air damper opens fully and indoor-air damper closes, allowing outside air to enter building.

Electronic programmable thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.

Thermostat and subbase provide heating and cooling unit control. The subbase provides system and fan switching at the thermostat location.

Low-ambient kit (Motormaster® II device) allows the use of mechanical cooling down to outdoor ambient temperatures as low as 0° F.

Solid-state Time Guard® device protects compressor by preventing short cycling.

Crankcase heater warms crankcase oil to reduce refrigerant migration and ensure proper compressor lubrication. (Recommended on 208/230-v single-phase units in sizes 024-042 only.)

Electric heaters provide heat in the unit when required. Each package has a heater module that slides into keyed mounting slots in the fan inlet. Heater sizes range from 5.0 to 20.0 kW. The electric heater design allows the use of a single-point power supply for the entire unit, resulting in lower installed costs.

High- and low-pressure switches provide additional safety features and protect the unit from running at unsuitable pressures.

Filter rack features easy installation, serviceability, and high filtering performance.

Duct cover kit covers horizontal ducts after unit has been converted to downflow discharge. Kit is not required with the downflow option.

Lifting bracket kit provides attachment points for rigging straps. The kit is not required when the unit is equipped with an optional base rail.

Rectangular duct connection kit allows easy conversion from round to rectangular ducts.

Outdoor thermostat brings second stage of 2-stage electric heater on line when the outdoor-air temperature falls below the set point.

Dimensions

UNIT SIZES 018-042 WITHOUT BASE RAIL

UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
018	208/230-1-60	208	95	61/28	43/20	69/31	35/16	24.1/613	18.2/462
024	208/230-1-60	237	108	60/27	54/25	92/42	31/14	24.1/613	18.2/462
030	208/230-1-60, 208/230-3-60	254	115	61/28	58/26	96/44	39/18	24.1/613	18.2/462
036	208/230-1-60, 208/230-3-60, 460-3-60	270	123	75/35	48/22	109/50	37/17	24.1/613	18.2/462
042	208/230-1-60, 208/230-3-60, 460-3-60	300	135	81/40	57/26	117/53	45/20	28.1/714	22.2/563

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
018	19.6/499	21.7/551	10.6/269
024	22.5/570	20.9/530	10.0/254
030	22.1/561	20.3/516	10.0/253
036	21.2/538	19.9/506	9.9/251
042	21.3/540	19.9/506	11.3/286

LEGEND

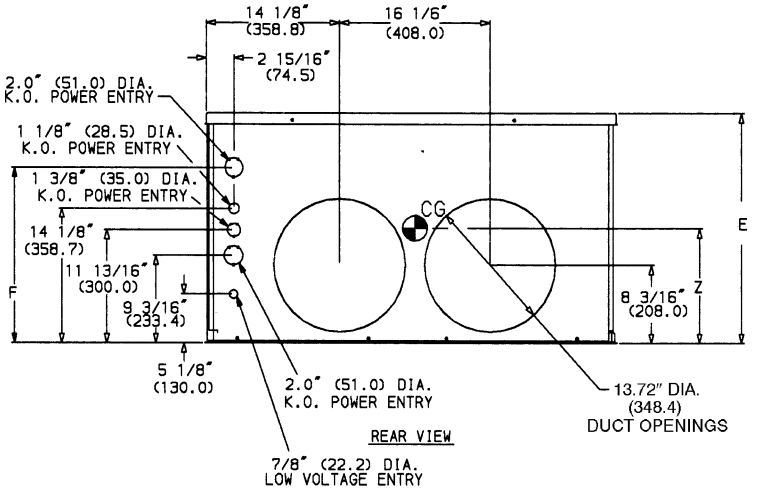
CG — Center of Gravity
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

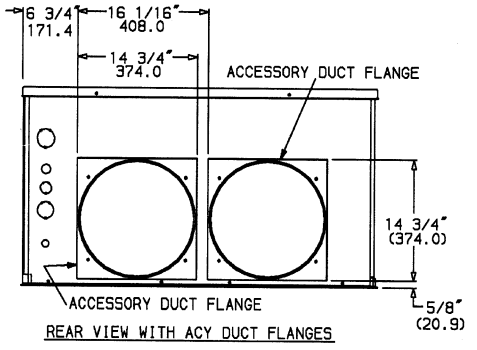
REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL
in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

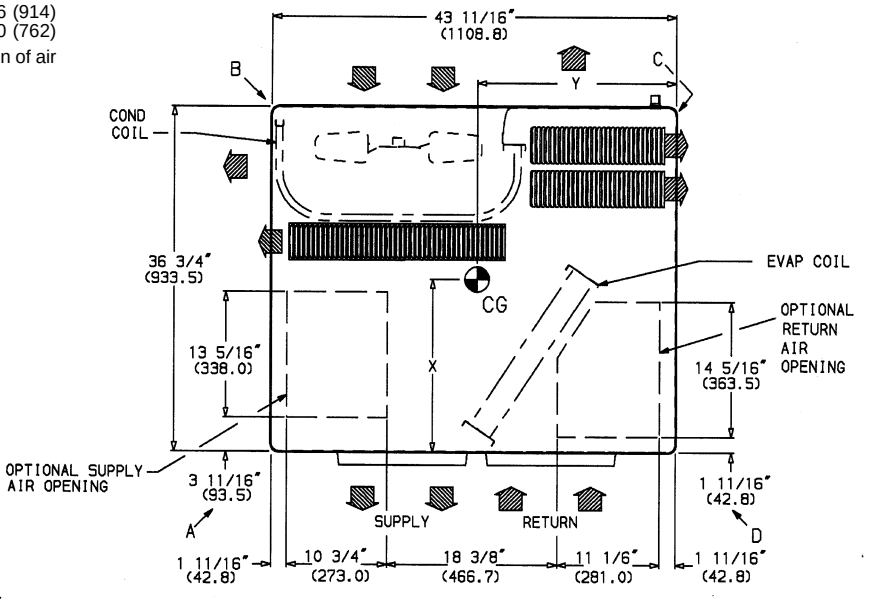
NECESSARY REQUIRED CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other
Grounded Surfaces, Control Box Side 42 (1067)

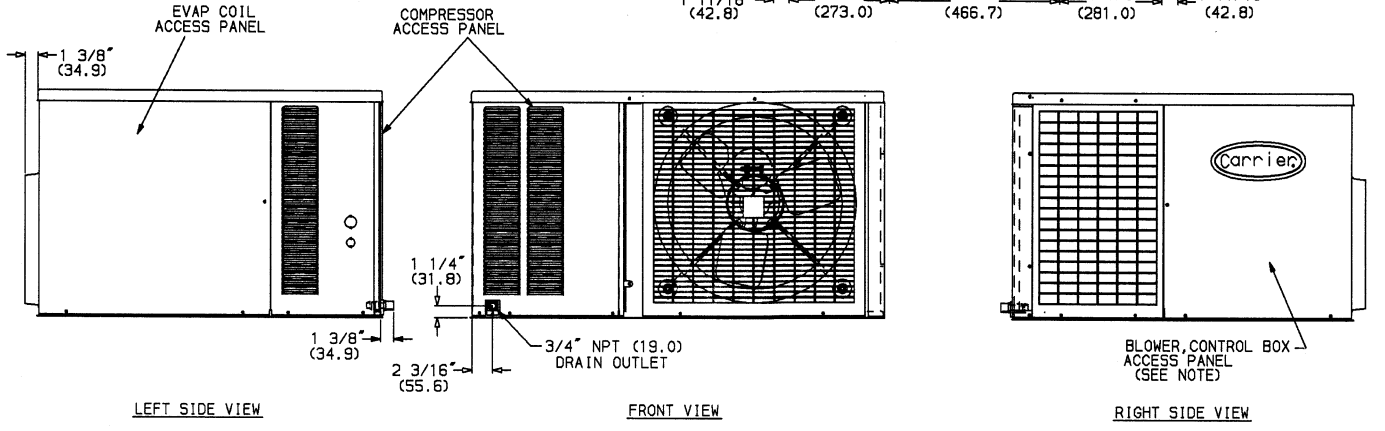
REQUIRED CLEARANCES FOR SERVICING — in. (mm)
Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor fan discharge.









Dimensions (cont)

UNIT SIZES 018-042 WITH OPTIONAL BASE RAIL

UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
018	208/230-1-60	228	104	66/30	48/22	74/34	40/18	27.4/697	21.5/546
024	208/230-1-60	257	117	65/30	59/27	97/44	36/16	27.4/697	21.5/546
030	208/230-1-60, 208/230-3-60	274	125	66/30	63/29	101/46	44/20	27.4/697	21.5/546
036	208/230-1-60, 208/230-3-60, 460-3-60	290	132	81/37	53/24	114/52	42/19	27.4/697	21.5/546
042	208/230-1-60, 208/230-3-60, 460-3-60	320	146	86/39	62/28	122/55	50/23	31.4/798	25.5/648

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
018	19.5/495	21.7/551	12.9/328
024	22.1/562	20.9/532	12.3/313
030	21.8/554	20.4/519	12.3/312
036	21.0/533	20.1/509	12.2/310
042	21.0/532	20.1/510	13.6/344

LEGEND

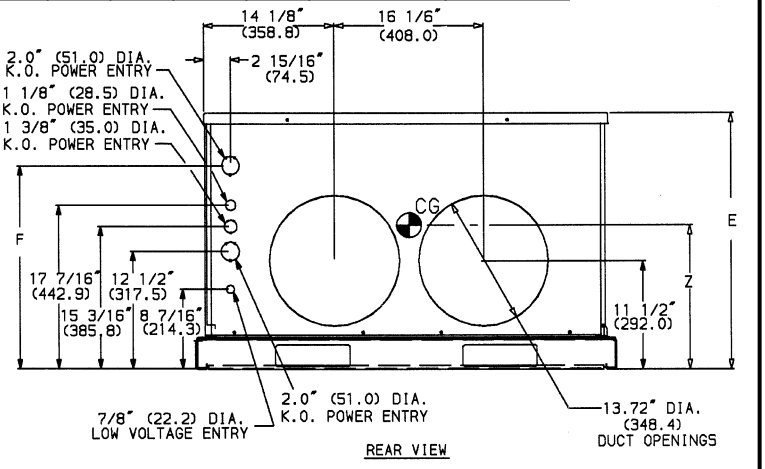
CG — Center of Gravity
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL
in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

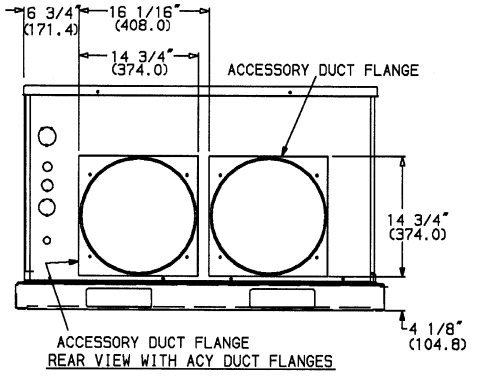
NECESSARY REQUIRED CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other
Grounded Surfaces, Control Box Side 42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)
Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

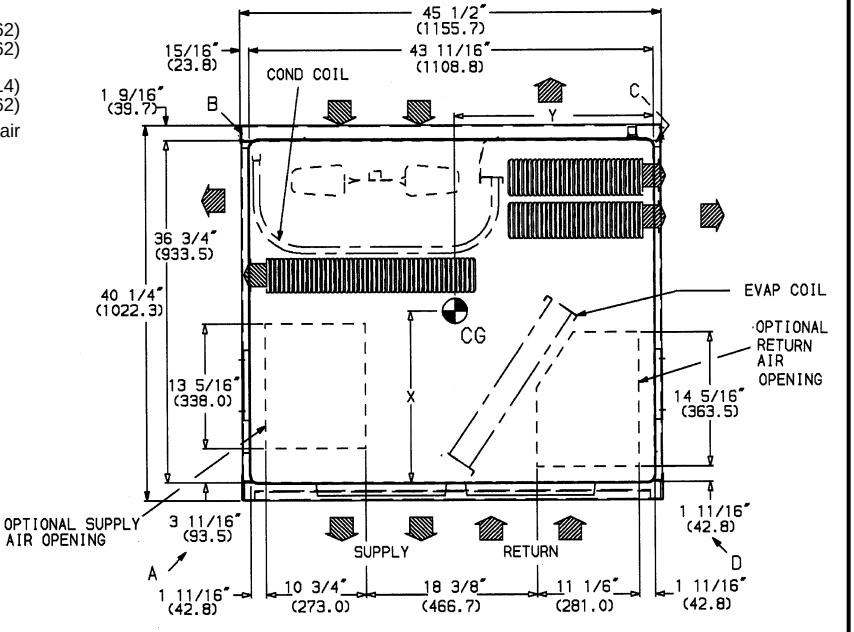
NOTE: Clearances must be maintained to prevent recirculation of air from outdoor fan discharge.

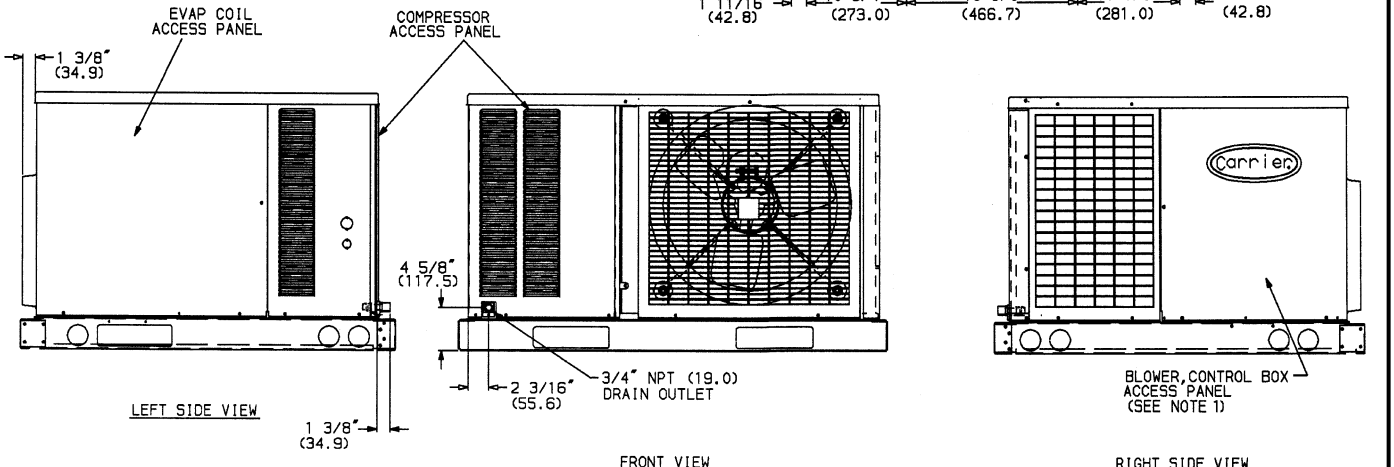


REAR VIEW



REAR VIEW WITH ACY DUCT FLANGES





UNIT SIZES 048, 060 WITHOUT BASE RAIL

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL
in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other
Grounded Surfaces, Control Box Side 42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)
Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor fan discharge.

UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
048	208/230-1-60, 208/230-3-60, 460-3-60	332	151	82/37	68/31	131/60	51/23
060	208/230-1-60, 208/230-3-60, 460-3-60	359	163	65/30	99/45	120/55	75/34

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
048	21.9/555	19.6/498	13.4/341
060	22.2/565	19.8/503	13.4/340

LEGEND

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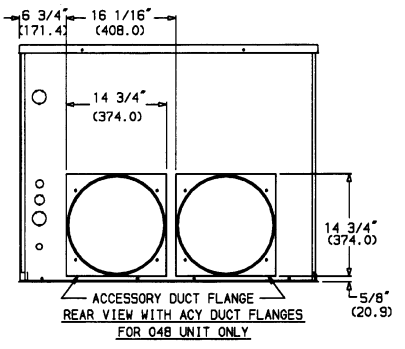
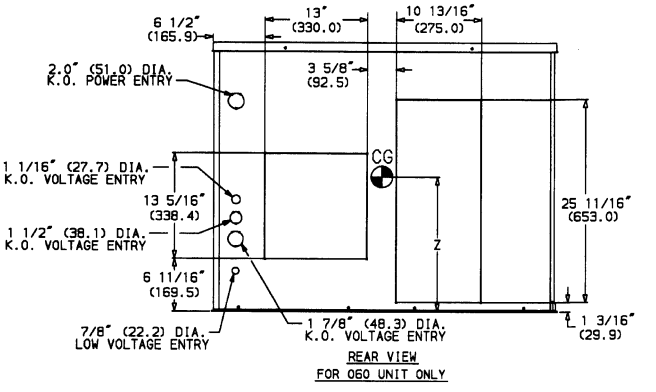
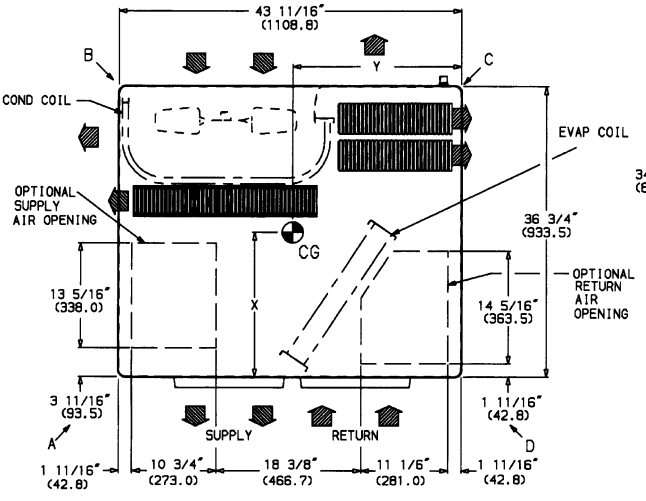
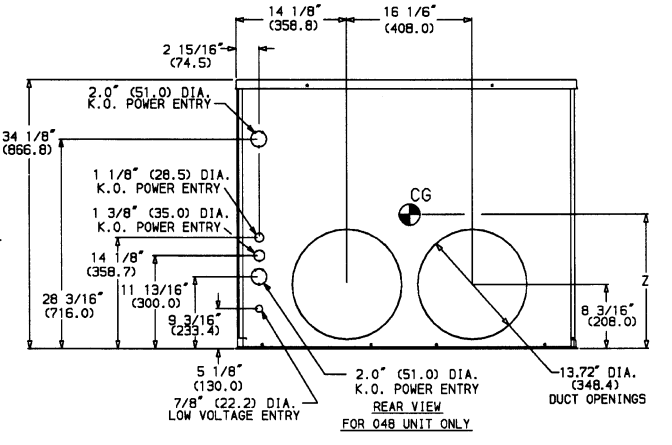
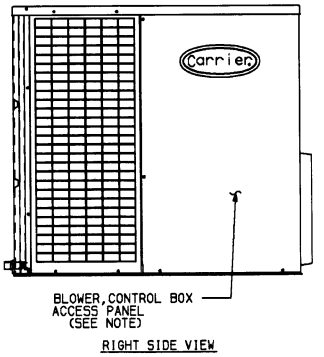
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

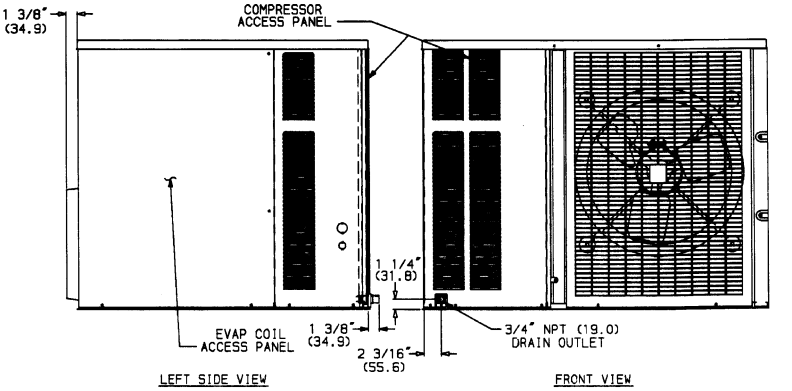












Dimensions (cont)

UNIT SIZES 048, 060 WITH OPTIONAL BASE RAIL

UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
048	208/230-1-60, 208/230-3-60, 460-3-60	352	160	87/40	73/33	136/62	56/25
060	208/230-1-60, 208/230-3-60, 460-3-60	379	172	70/32	104/47	125/57	80/36

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
048	21.7/550	19.7/501	15.7/400
060	22.0/560	19.9/506	15.7/399

LEGEND

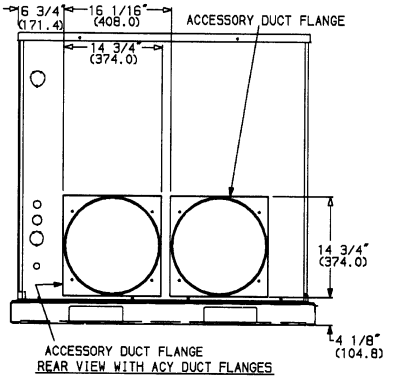
CG — Center of Gravity
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

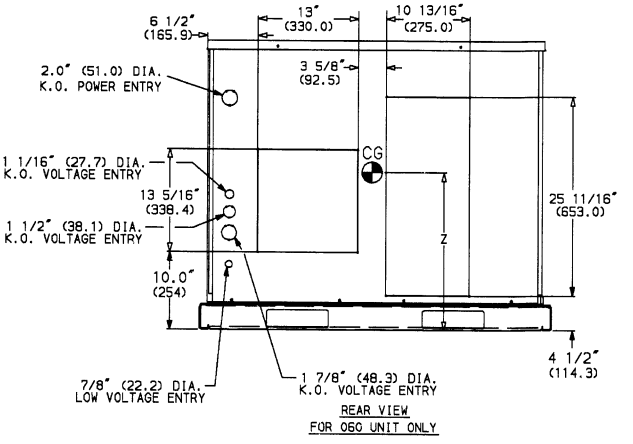
REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL in. (mm)
Unit Top 0
Duct Side of Unit 0
Side Opposite Ducts 0
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

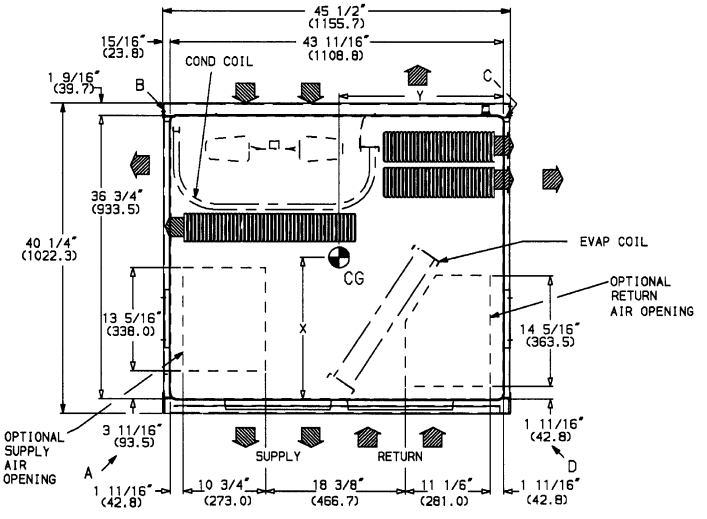
NECESSARY REQUIRED CLEARANCES — in. (mm)
Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side 42 (1067)

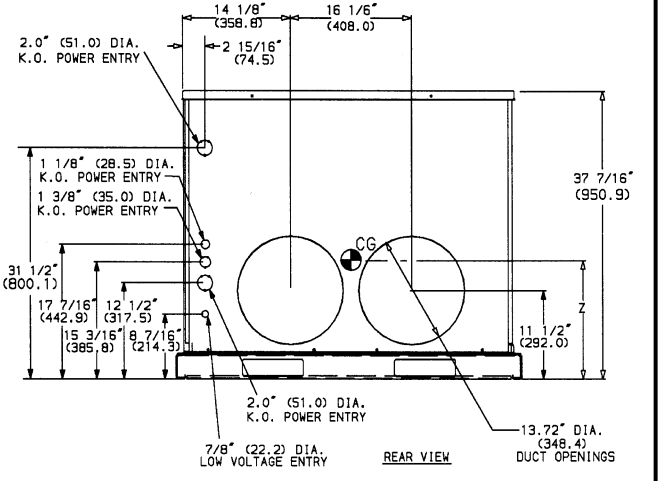
REQUIRED CLEARANCES FOR SERVICING — in. (mm)
Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

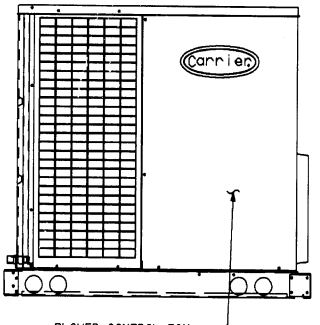
NOTE: Clearances must be maintained to prevent recirculation of air from outdoor fan discharge.

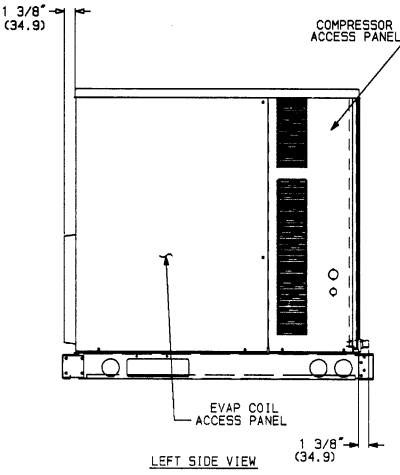


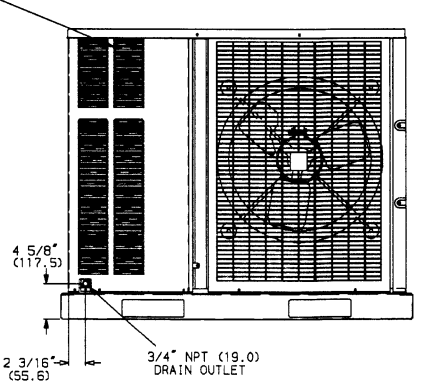






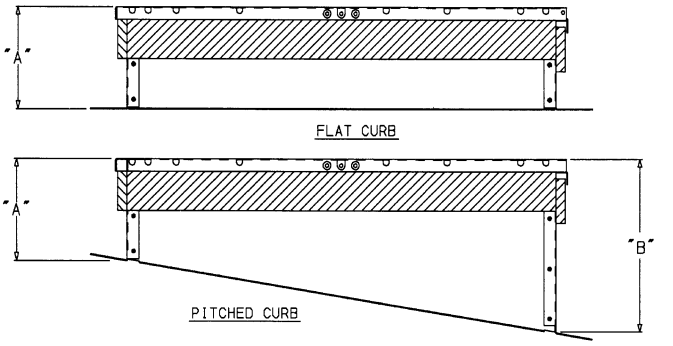






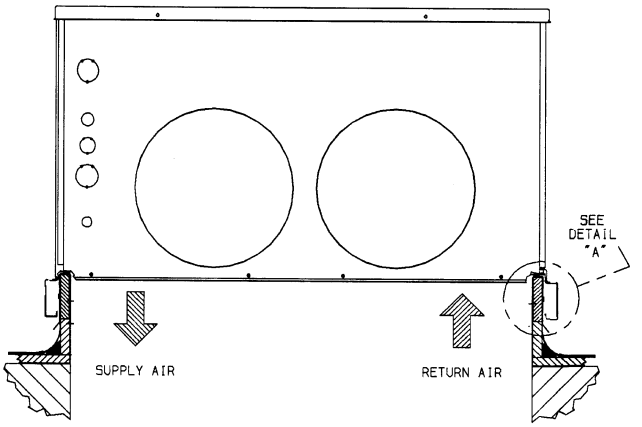
ROOF CURB DIMENSIONS

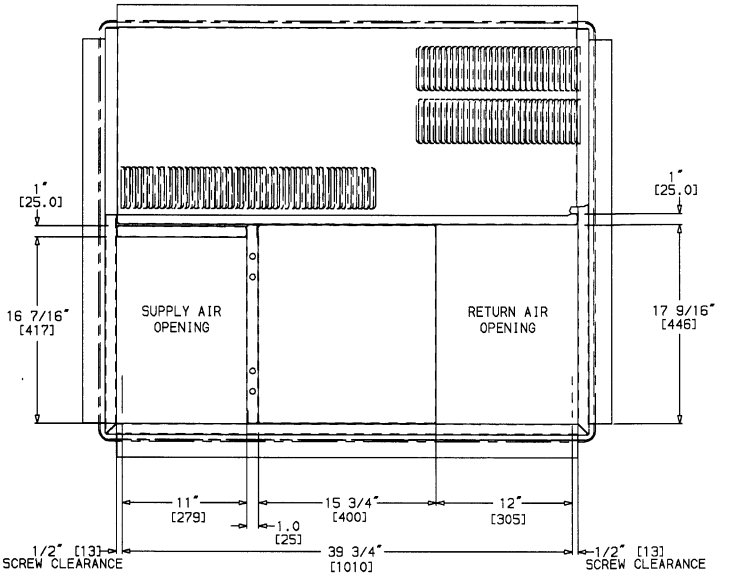
	PART NUMBER	"A"	"B"	PITCH
FLAT	50SS900015	8″ [203]	—	—
	50SS900016	11″ [279]	—	—
	50SS900017	14″ [356]	—	—
PITCHED	50SS900019	8″ [203]	10⅞″ [276]	1:12
	50SS900020	8″ [203]	13⁹⁄₁₆″ [344]	2:12
	50SS900021	8″ [203]	16⅜″ [416]	3:12
	50SS900022	8″ [203]	19¼″ [489]	4:12
	50SS900023	8″ [203]	22⅜″ [568]	5:12
	50SS900024	8″ [203]	25⅝″ [651]	6:12

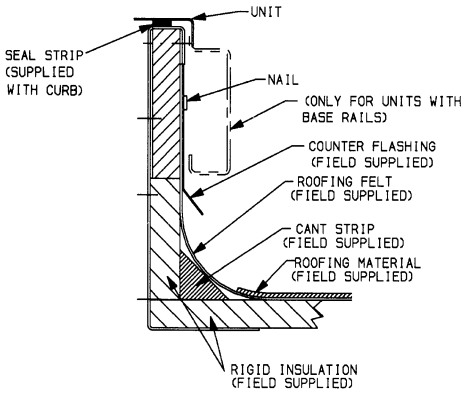


NOTES:
1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied as required for unit being installed.
3. Dimensions in [ ] are in millimeters.
4. Roof curb is made of 16 gage steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side.
7. Direction of airflow.
8. Insulated panels: 1-in. thick fiberglass, 1-lb density.

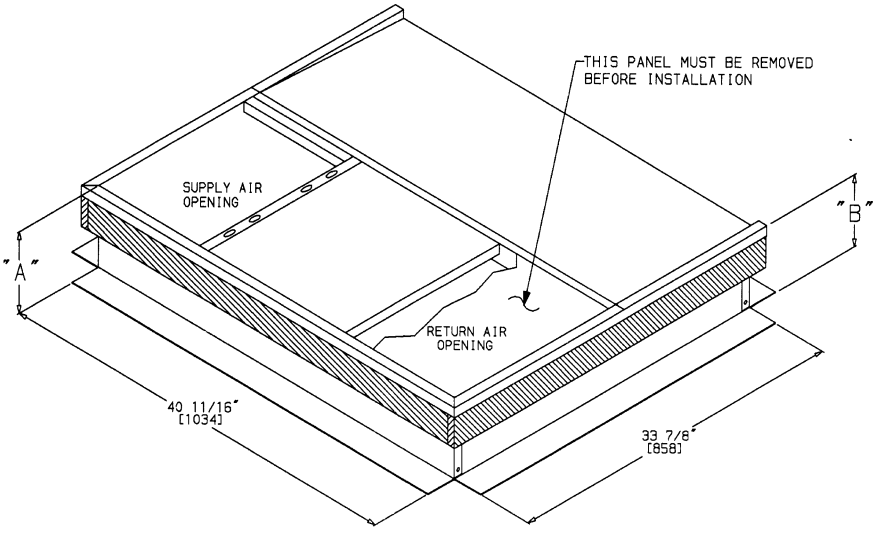
.







DETAIL "A"



Selection procedure

I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC) ..... 35,000 Btuh
Sensible Heat Capacity (SHC) ..... 26,000 Btuh
Required Heating Capacity ..... 15,000 Btuh
Outdoor Entering-Air Temperature ..... 95 F
Indoor Entering-Air
Temperature ..... 80 F edb; 67 F ewb
Indoor-Air Quantity ..... 1200 cfm
External Static Pressure ..... 0.20 in. wg
Electrical Characteristics (V-Ph-Hz) 230-1-60

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at condenser entering temperature of 95 F, indoor air entering at 1200 cfm and 67 F ewb. The 50SS036 unit provides a total cooling capacity of 36,000 Btuh and a sensible heat capacity of 26,200 Btuh.

For indoor-air temperature other than 80 F edb, calculate sensible heat capacity correction, as required, using the formula found in Note 4 following the Cooling Capacities tables.

NOTE: Unit ratings are net capacities.

III Select electric heat.

The required heating capacity is 15,000 Btuh (given). Determine the electric heat capacity in kW.

$$\frac{15{,}000 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 4.4 \text{ kW of heat required}$$

Enter the Electric Heater Packages table on page 16 for 208/240, single-phase, 50SS036 unit. The 5-kW heater at 240 v most closely satisfies the heating required. To calculate kW at 230 v, multiply the heater kW by multiplication factor 0.92 found in the Wattage Multiplication Factors table on page 18.

5 kW x 0.92 = 4.6 kW
4.6 kW x 3414 Btuh/kW = 15,704 Btuh

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required. From the given, Filter Pressure Drop table, the Accessory Electric Heat Pressure Drop table, and the Wet Coil Pressure Drop table, find:

External static pressure	0.20 in. wg
Filter	0.13 in. wg
Electric Heat	0.042 in. wg
Wet Coil	0.088 in. wg
Total static pressure	0.46 in. wg

Enter the table for Dry Coil Air Delivery — Horizontal Discharge, 230 and 460 V. At 0.5 in. wg external static pressure and medium speed, the motor delivers 1190 cfm. Interpolating for 0.46 in. wg delivers 1222 cfm, which satisfies the job requirements.

Performance data

COOLING CAPACITIES

50SS018

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		525/0.10			600/0.12			675/0.13		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	15.8	17.5	19.0	16.0	17.6	19.2	16.1	17.8	19.3
	SHC	13.6	11.3	8.69	14.4	11.8	8.96	15.1	12.4	9.18
	kW	1.66	1.71	1.74	1.71	1.76	1.80	1.76	1.80	1.84
95	TC	15.2	16.9	18.5	15.4	17.0	18.7	15.6	17.1	18.8
	SHC	13.4	11.1	8.55	14.2	11.6	8.87	14.9	12.2	9.08
	kW	1.79	1.84	1.89	1.85	1.89	1.94	1.89	1.94	1.98
105	TC	14.6	16.1	17.9	14.8	16.3	17.9	14.9	16.4	18.0
	SHC	13.2	10.8	8.37	14.0	11.3	8.60	14.6	11.9	8.82
	kW	1.93	1.98	2.04	1.99	2.03	2.08	2.03	2.08	2.13
115	TC	13.8	15.5	17.1	14.1	15.6	17.3	14.3	15.6	17.4
	SHC	12.8	10.6	8.10	13.6	11.1	8.43	14.2	11.7	8.73
	kW	2.08	2.13	2.19	2.13	2.18	2.24	2.18	2.23	2.29

50SS024

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		700/0.06			800/0.07			900/0.08		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	22.5	25.1	27.8	23.0	25.6	28.3	23.4	26.0	28.7
	SHC	19.8	16.6	13.2	21.2	17.6	13.7	22.3	18.6	14.2
	kW	2.51	2.60	2.69	2.56	2.65	2.75	2.62	2.71	2.80
95	TC	21.1	23.6	26.3	21.5	24.0	26.6	21.9	24.4	27.0
	SHC	19.3	16.1	12.7	20.5	17.1	13.1	21.5	18.1	13.7
	kW	2.63	2.73	2.84	2.69	2.79	2.89	2.75	2.85	2.95
105	TC	19.6	22.0	24.6	20.0	22.4	25.0	20.5	22.6	25.3
	SHC	18.5	15.5	12.1	19.7	16.5	12.7	20.5	17.4	13.2
	kW	2.74	2.86	2.97	2.81	2.92	3.03	2.88	2.97	3.09
115	TC	17.9	20.3	22.9	18.6	20.6	23.2	19.2	20.9	23.5
	SHC	17.6	14.9	11.6	18.5	15.9	12.2	19.2	16.9	12.7
	kW	2.85	2.97	3.10	2.93	3.03	3.16	3.01	3.09	3.21

50SS030

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		875/0.08			1000/0.09			1125/0.10		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	27.5	30.7	33.7	28.0	31.1	34.0	28.4	31.3	34.5
	SHC	25.2	21.0	16.3	26.8	22.3	16.9	28.2	23.4	17.6
	kW	3.01	3.09	3.16	3.07	3.15	3.22	3.13	3.20	3.28
95	TC	25.8	28.8	31.7	26.3	29.2	32.3	26.9	29.4	32.4
	SHC	24.4	20.4	15.6	25.9	21.6	16.4	26.9	22.7	16.9
	kW	3.16	3.25	3.33	3.23	3.31	3.40	3.30	3.37	3.44
105	TC	23.9	26.9	29.9	24.6	27.2	30.1	25.3	27.5	30.5
	SHC	23.4	19.6	15.0	24.6	20.9	15.6	25.3	22.1	16.4
	kW	3.30	3.40	3.49	3.38	3.46	3.54	3.45	3.52	3.61
115	TC	21.9	24.8	27.6	22.9	25.0	28.0	23.6	25.2	28.1
	SHC	21.9	18.8	14.2	22.9	20.1	15.0	23.6	21.2	15.6
	kW	3.44	3.53	3.62	3.52	3.59	3.69	3.59	3.64	3.74

50SS036

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1050/0.07			1200/0.08			1350/0.09		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	33.6	37.6	41.7	34.2	38.3	42.3	34.8	38.7	42.6
	SHC	30.5	25.4	19.9	32.5	27.1	20.7	34.2	28.5	21.4
	kW	3.72	3.86	3.99	3.81	3.95	4.08	3.90	4.03	4.15
95	TC	31.2	35.5	39.3	31.9	36.0	40.2	32.8	36.4	40.4
	SHC	29.4	24.7	19.1	31.4	26.2	20.1	32.8	27.7	20.8
	kW	3.90	4.05	4.18	3.99	4.14	4.29	4.09	4.22	4.36
105	TC	28.8	33.2	37.2	30.0	33.7	37.6	31.1	34.0	37.9
	SHC	28.2	23.8	18.4	30.0	25.4	19.2	31.0	26.8	20.0
	kW	4.08	4.23	4.39	4.17	4.32	4.48	4.29	4.41	4.56
115	TC	26.7	30.9	34.7	28.1	31.3	35.0	29.2	31.6	35.2
	SHC	26.7	22.9	17.5	28.1	24.5	18.3	29.2	25.9	19.0
	kW	4.26	4.41	4.57	4.37	4.50	4.66	4.48	4.58	4.73

50SS042

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1225/0.11			1400/0.12			1575/0.14		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	39.4	42.9	46.1	40.0	43.4	46.7	40.6	44.0	47.1
	SHC	35.0	28.9	22.3	37.0	30.3	23.0	38.8	31.7	23.7
	kW	4.21	4.35	4.47	4.32	4.45	4.57	4.43	4.56	4.67
95	TC	37.3	40.5	43.7	37.9	41.0	44.3	38.4	41.6	44.6
	SHC	34.1	28.0	21.5	36.0	29.4	22.2	37.7	30.9	22.9
	kW	4.44	4.58	4.71	4.55	4.68	4.82	4.66	4.79	4.92
105	TC	34.9	38.2	41.2	35.6	38.6	41.7	36.1	39.1	42.0
	SHC	32.9	27.1	20.6	34.8	28.5	21.3	36.0	30.1	22.0
	kW	4.65	4.81	4.95	4.77	4.91	5.06	4.87	5.03	5.16
115	TC	32.5	35.7	38.6	33.2	36.1	39.1	33.9	36.5	39.2
	SHC	31.7	26.2	19.6	33.2	27.6	20.4	33.9	29.1	21.0
	kW	4.86	5.02	5.18	4.97	5.13	5.29	5.10	5.24	5.39

LEGEND

BF — Bypass Factor
Ewb — Entering Wet-Bulb
kW — Total Unit Power Input
SHC — Sensible Heat Capacity, 1000 Btuh
TC — Total Cooling Capacity, 1000 Btuh (net)

NOTES:
1. Ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

4. The SHC is based on 80 F edb temperature of air entering indoor coil.
   Below 80 F edb, subtract (corr factor x cfm) from SHC.
   Above 80 F edb, add (corr factor x cfm) to SHC.
   Correction Factor = 1.10 x (1 – BF) x (edb – 80).

Performance data (cont)

COOLING CAPACITIES (cont)

50SS048

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1400/0.08			1600/0.10			1800/0.11		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	62
85	TC	43.8	48.4	52.9	44.6	49.1	53.8	45.2	49.7	54.3
	SHC	39.6	32.8	25.6	42.1	34.8	26.4	44.3	36.7	27.4
	kW	4.61	4.70	4.79	4.72	4.82	4.90	4.84	4.93	5.01
95	TC	41.6	46.4	51.0	42.4	47.0	51.7	43.2	47.4	52.2
	SHC	38.5	32.1	24.9	41.0	34.0	25.9	43.1	35.8	26.9
	kW	5.00	5.11	5.20	5.12	5.22	5.32	5.24	5.33	5.43
105	TC	39.0	44.2	48.9	39.8	44.8	49.6	40.9	45.2	50.0
	SHC	37.2	31.3	24.2	39.6	33.2	25.2	40.9	35.1	26.3
	kW	5.42	5.55	5.65	5.55	5.66	5.77	5.68	5.77	5.89
115	TC	36.3	41.7	46.6	37.4	42.3	47.1	38.7	42.8	47.5
	SHC	35.8	30.3	23.4	37.3	32.4	24.5	38.7	34.3	25.6
	kW	5.88	6.01	6.14	6.02	6.13	6.26	6.15	6.25	6.37

50SS060

TEMP (F) AIR ENT COND		EVAP AIR — CFM/BF								
		1750/0.03			2000/0.04			2250/0.05		
		Evap Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	55.0	62.0	69.4	56.3	63.1	70.5	58.2	63.9	71.3
	SHC	52.4	43.7	34.2	56.1	46.7	35.8	58.1	49.5	37.4
	kW	6.14	6.33	6.53	6.32	6.50	6.70	6.52	6.67	6.88
95	TC	51.8	58.5	66.2	53.6	59.6	67.3	55.6	60.2	68.1
	SHC	51.0	42.4	33.2	53.5	45.3	34.8	55.6	48.2	36.3
	kW	6.62	6.82	7.05	6.83	7.00	7.22	7.03	7.17	7.39
105	TC	48.7	55.1	62.9	51.0	56.0	63.9	53.0	56.7	64.5
	SHC	48.7	41.1	32.1	50.9	44.0	33.7	52.8	46.9	35.3
	kW	7.17	7.37	7.60	7.39	7.54	7.78	7.59	7.71	7.95
115	TC	45.8	52.0	59.5	48.5	52.8	60.5	50.4	53.4	60.8
	SHC	45.8	40.0	30.9	48.4	42.8	32.6	50.3	45.6	34.1
	kW	7.77	7.94	8.19	7.98	8.12	8.36	8.18	8.29	8.43

LEGEND

BF — Bypass Factor
Ewb — Entering Wet-Bulb
kW — Total Unit Power Input
SHC — Sensible Heat Capacity, 1000 Btuh
TC — Total Cooling Capacity, 1000 Btuh (net)

NOTES:

1. Ratings are net; they account for the effects of the indoor-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

4. The SHC is based on 80 F edb temperature of air entering indoor coil.
   Below 80 F edb, subtract (corr factor x cfm) from SHC.
   Above 80 F edb, add (corr factor x cfm) to SHC.
   Correction Factor = 1.10 x (1 – BF) x (edb – 80).

DRY COIL AIR DELIVERY* — HORIZONTAL DISCHARGE
(Deduct 10% for 208 v)

UNIT SIZE	MOTOR SPEED		230 AND 460 V HORIZONTAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Watts	230	225	220	210	195	170	—	—	—	—	—
		Cfm	760	745	725	695	640	540	—	—	—	—	—
	High	Watts	—	—	—	—	270	235	200	—	—	—	—
		Cfm	—	—	—	—	850	700	450	—	—	—	—
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	460	450	420	400	380	360	335	—	—	—
		Cfm	—	1240	1190	1125	1060	995	920	840	—	—	—
	Med	Watts	—	—	—	480	460	435	410	375	—	—	—
		Cfm	—	—	—	1280	1200	1115	1020	910	—	—	—
	High	Watts	—	—	—	—	—	560	530	510	490	490	—
		Cfm	—	—	—	—	—	1270	1180	1080	1000	870	—
036	Low	Watts	470	460	455	445	430	415	400	380	350	—	—
		Cfm	1280	1250	1230	1200	1150	1100	1050	980	890	—	—
	Med	Watts	550	535	520	500	480	460	440	410	385	—	—
		Cfm	1500	1450	1400	1330	1270	1190	1120	1030	940	—	—
	High	Watts	—	—	—	—	625	595	550	520	500	470	425
		Cfm	—	—	—	—	1540	1440	1325	1220	1110	1000	800
042	Low	Watts	730	700	680	645	615	580	535	490	430	—	—
		Cfm	1620	1590	1550	1510	1460	1390	1310	1210	1050	—	—
	High	Watts	—	—	—	—	—	850	800	750	700	650	610
		Cfm	—	—	—	—	—	1780	1670	1550	1400	1230	1050
048	Low	Watts	1080	1040	1020	970	910	840	785	730	680	620	540
		Cfm	2100	2090	2080	2060	1980	1900	1810	1710	1590	1450	1200
	High	Watts	1230	1190	1125	1060	1010	940	880	820	760	710	660
		Cfm	2390	2340	2280	2210	2150	2030	1900	1770	1630	1480	1300
060	Low	Watts	1150	1100	1050	1010	950	900	850	800	730	650	—
		Cfm	2500	2410	2330	2260	2170	2080	1990	1880	1750	1580	—
	High	Watts	—	—	—	—	—	1170	1110	1050	990	920	880
		Cfm	—	—	—	—	—	2470	2340	2200	2040	1870	1700

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

Performance data (cont)

DRY COIL AIR DELIVERY* — VERTICAL DISCHARGE
(Deduct 10% for 208 v)

UNIT SIZE	MOTOR SPEED		230 AND 460 V VERTICAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Watts	230	225	220	210	195	170	—	—	—	—	—
		Cfm	760	745	725	695	640	540	—	—	—	—	—
	High	Watts	—	—	—	—	270	235	200	—	—	—	—
		Cfm	—	—	—	—	850	700	450	—	—	—	—
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	460	450	420	400	380	360	335	—	—	—
		Cfm	—	1240	1190	1125	1060	995	920	840	—	—	—
	Med	Watts	—	—	—	480	460	435	410	375	—	—	—
		Cfm	—	—	—	1280	1200	1115	1020	910	—	—	—
	High	Watts	—	—	—	—	—	560	530	510	490	460	—
		Cfm	—	—	—	—	—	1270	1180	1080	1000	870	—
036	Low	Watts	470	460	455	445	430	415	400	380	350	—	—
		Cfm	1280	1250	1230	1200	1150	1100	1050	980	890	—	—
	Med	Watts	550	535	520	500	480	460	440	410	385	—	—
		Cfm	1500	1450	1400	1330	1270	1190	1120	1030	940	—	—
	High	Watts	—	—	—	—	625	595	550	520	500	470	425
		Cfm	—	—	—	—	1540	1440	1325	1220	1110	1000	800
042	Low	Watts	730	700	680	645	615	580	535	490	430	—	—
		Cfm	1620	1590	1550	1510	1460	1390	1310	1210	1050	—	—
	High	Watts	—	—	—	—	—	850	800	750	700	650	610
		Cfm	—	—	—	—	—	1780	1670	1550	1400	1230	1050
048	Low	Watts	1080	1040	1020	970	910	840	785	730	680	620	540
		Cfm	2100	2090	2080	2060	1980	1900	1810	1710	1590	1450	1200
	High	Watts	1230	1190	1125	1060	1010	940	880	820	760	710	660
		Cfm	2390	2340	2280	2210	2150	2030	1900	1770	1630	1480	1300
060	Low	Watts	890	850	810	780	740	710	660	630	580	—	—
		Cfm	2500	2410	2330	2260	2170	2080	1970	1860	1700	—	—
	High	Watts	—	—	—	1000	960	910	870	830	790	750	—
		Cfm	—	—	—	2480	2370	2250	2120	2000	1850	1690	—

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

WET COIL PRESSURE DROP

UNIT SIZE	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
018	600	0.069
	700	0.082
	800	0.102
	900	0.116
024	600	0.039
	700	0.058
	800	0.075
	900	0.088
030	900	0.088
	1000	0.095
	1200	0.123
036	1000	0.068
	1200	0.088
	1400	0.108
	1600	0.123
042	1000	0.048
	1200	0.069
	1400	0.088
	1600	0.102
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

ACCESSORY ELECTRIC HEAT PRESSURE DROP (in. wg)

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5-20	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

FILTER PRESSURE DROP (in. wg)

UNIT SIZE	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
018, 024	20 x 20	0.05	0.07	0.08	0.10	0.12	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—
030, 036	20 x 24	—	—	—	—	0.09	0.10	0.11	0.13	0.14	0.15	0.16	—	—	—	—	—	—	—	—
042	24 x 24	—	—	—	—	—	—	—	—	0.11	0.12	0.14	0.15	—	—	—	—	—	—	—
048, 060	24 x 30	—	—	—	—	—	—	—	—	—	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

ACCESSORY ELECTRIC HEATER PACKAGE USAGE — DUAL-POINT POWER CONNECTIONS

ELECTRIC HEATER ACCESSORY KIT	KIT PART NUMBER 50SS900	UNIT SIZE						
		018	024	030	036	042	048	060
208/240-1-60*								
5.0 kW	001	X	X	X	X	X	X	X
7.5 kW	002	X	X	X	X	X	X	X
10.0 kW	003	X	X	X	X	X	X	X
15.0 kW	086	—	—	X	X	X	X	X
17.5 kW	005	—	—	—	X	—	—	—
20.0 kW	006	—	—	—	—	X	X	X
208/240-3-60*								
10.0 kW	007	—	—	X	X	X	X	X
15.0 kW	008	—	—	X	X	X	X	X
17.5 kW	009	—	—	—	X	X	X	X
480-3-60								
10.0 kW	010	—	—	—	X	X	X	X
15.0 kW	011	—	—	—	X	X	X	X
17.5 kW	012	—	—	—	X	X	X	X

*kW shown at 240 v.

Performance data (cont)

ELECTRIC HEATER PACKAGES — 208/240 V, SINGLE-PHASE — SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT 50SS900	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR		MOCP	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
018	001	3.75	5.0	18.0	20.8	24.8	28.3	25	30	—	—
	002	5.60	7.5	26.9	31.3	35.9	41.3	40	45	—	—
	003	7.50	10.0	36.1	40.6	47.3	53.0	50	60	—	—
024	001	3.75	5.0	18.0	20.8	25.0	28.5	30	30	—	—
	002	5.60	7.5	26.9	31.3	36.2	41.6	40	45	—	—
	003	7.50	10.0	36.1	40.6	47.6	53.3	50	60	—	—
030	001	3.75	5.0	18.0	20.8	25.0	28.5	30	30	—	—
	002	5.60	7.5	26.9	31.3	36.2	41.6	40	45	—	—
	003	7.50	10.0	36.1	40.6	47.6	53.3	50	60	—	—
	086	11.30	15.0	54.3	62.5	70.4	80.6	—	—	80	90
036	001	3.75	5.0	18.0	20.8	26.7	29.5	40	40	—	—
	002	5.60	7.5	26.9	31.3	37.2	42.6	40	45	—	—
	003	7.50	10.0	36.1	40.6	48.6	54.3	50	60	—	—
	086	11.30	15.0	54.3	62.5	71.4	81.6	—	—	80	90
	005	13.10	17.5	65.6	75.0	85.5	97.3	—	—	90	100
042	001	3.75	5.0	18.0	20.8	30.9	31.0	50	50	—	—
	002	5.60	7.5	26.9	31.3	38.7	44.1	50	50	—	—
	003	7.50	10.0	36.1	40.6	50.1	55.8	60	60	—	—
	086	11.30	15.0	54.3	62.5	72.9	83.1	—	—	80	90
	006	15.00	20.0	72.1	83.3	95.1	109.2	—	—	100	110
048	001	3.75	5.0	18.0	20.8	40.1	40.1	60	60	—	—
	002	5.60	7.5	26.9	31.3	40.1	45.3	60	60	—	—
	003	7.50	10.0	36.1	40.6	51.3	57.0	60	60	—	—
	086	11.30	15.0	54.3	62.5	74.2	84.4	—	—	80	90
	006	15.00	20.0	72.1	83.3	96.4	110.4	—	—	100	125
060	001	3.75	5.0	18.0	20.8	49.0	49.0	60	60	—	—
	002	5.60	7.5	26.9	31.3	49.0	49.0	60	60	—	—
	003	7.50	10.0	36.1	40.6	53.6	59.3	60	60	—	—
	086	11.30	15.0	54.3	62.5	76.4	86.6	—	—	80	90
	006	15.00	20.0	72.1	83.3	98.7	112.6	—	—	100	125

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table, page 18.

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.

ELECTRIC HEATER PACKAGES — 208/240 V, 3-PHASE — SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT 50SS900	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
030	007	7.5	10.0	20.9	24.1	28.6	32.6	30	35
	008	11.3	15.0	31.3	36.1	41.6	47.7	45	50
036	007	7.5	10.0	20.9	24.1	29.6	33.6	30	35
	008	11.3	15.0	31.3	36.1	42.6	48.7	45	50
	009	13.1	17.5	36.5	41.0	49.1	54.8	50	60
042	007	7.5	10.0	20.9	24.1	31.1	35.1	35	40
	008	11.3	15.0	31.3	36.1	44.1	50.2	45	60
	009	13.1	17.5	36.5	41.0	50.6	56.3	60	60
048	007	7.5	10.0	20.9	24.1	32.3	36.3	40	40
	008	11.3	15.0	31.3	36.1	45.4	51.4	50	60
	009	13.1	17.5	36.5	41.0	51.8	57.5	60	60
060	007	7.5	10.0	20.9	24.1	34.6	38.6	50	50
	008	11.3	15.0	31.3	36.1	47.6	53.7	50	60
	009	13.1	17.5	36.5	41.0	54.1	59.8	60	60

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table, page 18.

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.

ELECTRIC HEATER PACKAGES — 480 V, 3-PHASE — SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT/ ACCESSORY KIT 50SS900	ELECTRIC HEAT (kW)*	HEATER FLA	MIN CIRCUIT AMPACITY FOR WIRE SIZING	MAX FUSE OR HACR BRKR
		480 V		480 V	480 V
036	010	10.0	12.2	17.0	20
	011	15.0	18.1	24.3	25
	012	17.5	21.1	28.1	30
042	010	10.0	12.2	17.8	20
	011	15.0	18.1	25.1	30
	012	17.5	21.1	28.8	30
048	010	10.0	12.2	18.1	20
	011	15.0	18.1	25.5	30
	012	17.5	21.1	29.2	30
060	010	10.0	12.2	19.3	25
	011	15.0	18.1	26.6	30
	012	17.5	21.1	30.3	35

LEGEND

FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

*Electric heat capacity (kW) is based on heater voltages of 480 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table, page 18.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.
2. This unit must be supplied from a 480 v, 3-phase power supply with a maximum voltage to ground of 300 v.

Performance data (cont)

WATTAGE MULTIPLICATION FACTORS

HEATER VOLTAGE RATING	ACTUAL HEATER VOLTAGE	MULTIPLICATION FACTOR
240	200	0.69
	208	0.75
	220	0.84
	230	0.92
	240	1.00
480	415	0.75
	440	0.84
	460	0.92
	480	1.00

Example: 20.0 kW (at 240 v) heater on 230 v
= 20.0 (0.92 multiplication factor)
= 18.4 kW capacity at 230 v

MINIMUM AIRFLOW (CFM) FOR SAFE ELECTRIC HEATER OPERATION

UNIT SIZE						
018	**024**	**030**	**036**	**042**	**048**	**060**
700	700	875	1200	1225	1400	1750

Electrical data

208/230 V, SINGLE PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY FUSE OR HACR BRKR		AWG 60C MIN WIRE	MAX WIRE LENGTH
	RLA	LRA	FLA	FLA	MCA	Max		
018	7.6	45	0.7	1.8	12.0	15	14	75
024	12.4	61	0.7	2.0	18.2	30	12	80
030	14.4	82	1.4	2.0	21.8	30	10	100
036	18.0	96	1.4	2.8	26.7	40	10	90
042	20.4	104	1.4	4.0	30.9	50	8	100
048	26.4	129	2.1	5.0	40.1	60	6	100
060	32.1	169	2.1	6.8	49.0	60	6	100

208/230 V, 3-PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY FUSE OR HACR BRKR		AWG 60C MIN WIRE	MAX WIRE LENGTH
	RLA	LRA	FLA	FLA	MCA	Max		
030	9.4	66	1.4	2.0	15.5	25	12	80
036	11.7	75	1.4	2.8	18.8	30	12	65
042	14.0	91	1.4	4.0	22.9	35	10	85
048	15.0	99	2.1	5.0	25.9	40	10	75
060	19.3	123	2.1	6.8	33.0	50	8	90

460 V, 3-PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY FUSE OR HACR BRKR		AWG 60C MIN WIRE	MAX WIRE LENGTH
	RLA	LRA	FLA	FLA	MCA	Max		
036	5.6	40	0.8	1.4	9.2	10	14	100
042	6.4	42	0.8	2.0	10.8	15	14	100
048	8.2	50	1.1	2.3	13.7	20	14	100
060	10.0	62	1.1	3.2	16.8	25	12	100

LEGEND

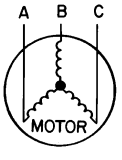
AWG — American Wire Gage
BRKR — Breaker
CSA — Canadian Standards Association
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The CSA units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 460-3-60.



AB = 452 v
BC = 464 v
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.
(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v
Maximum deviation is 7 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

$$= 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Sequence of operation

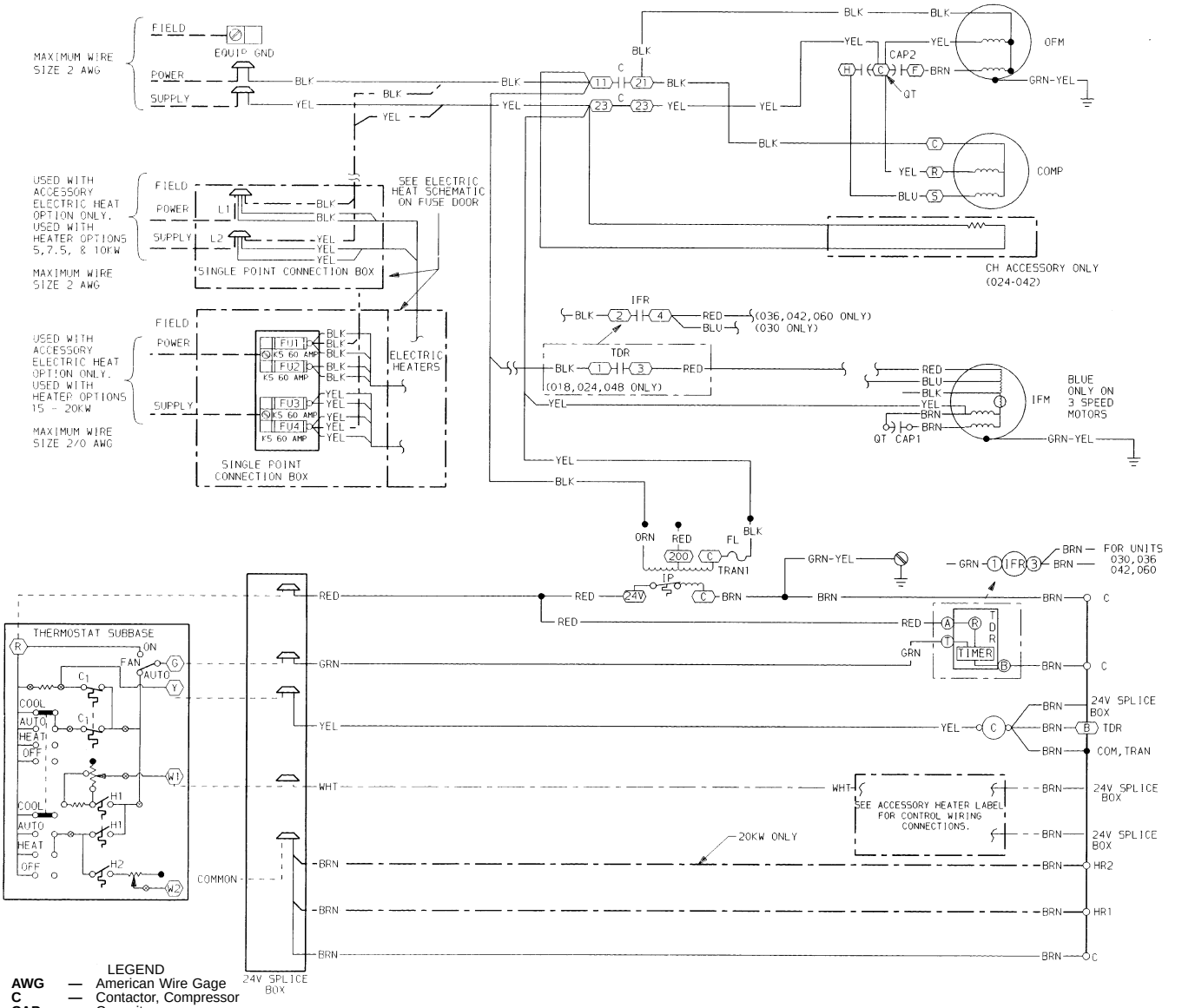
Cooling

NOTE: With the FAN switch in the ON position, 24 v is supplied to the indoor-fan relay (IFR) through the G terminal on the thermostat. This voltage energizes the coil of the contactor, closing the normally-open set of contracts which provide continuous power to the indoor-fan motor (IFM). Moving the FAN switch back to the AUTO. position, providing there is not a call for cooling, deenergizes the IFR, opens the IFR contacts, and deenergizes the IFM. The FAN switch in AUTO. position cycles upon a call for cooling.

On a call for cooling, 24 v is supplied to the compressor contactor (C) and IFR simultaneously through the Y and G terminals of the thermostat, respectively. On units with a compressor time delay relay, there is a built-in, 5-minute (± 45 seconds) delay between compressor starts. Energizing the contactor closes the normally-open set of contacts supplying power to both the compressor and outdoor-fan motor (OFM). Energizing the IFR closes the normally-open set of contacts providing power to the IFM. On the loss of the call for cooling, 24 v is removed from both the contactor and IFR and opening both the contacts supplying power to compressor/OFM and IFM.

Heating — If accessory electric heaters are installed, on a call for heat, circuit R-W is made through the thermostat contacts. Circuit R-G is made which energizes the IFR. If the heaters are staged, then the thermostat closes a second set of contacts (W2) when second stage is required. When thermostat is satisfied, contacts open, deenergizing the heater relay and the IFR.

Typical single-phase control wiring schematic

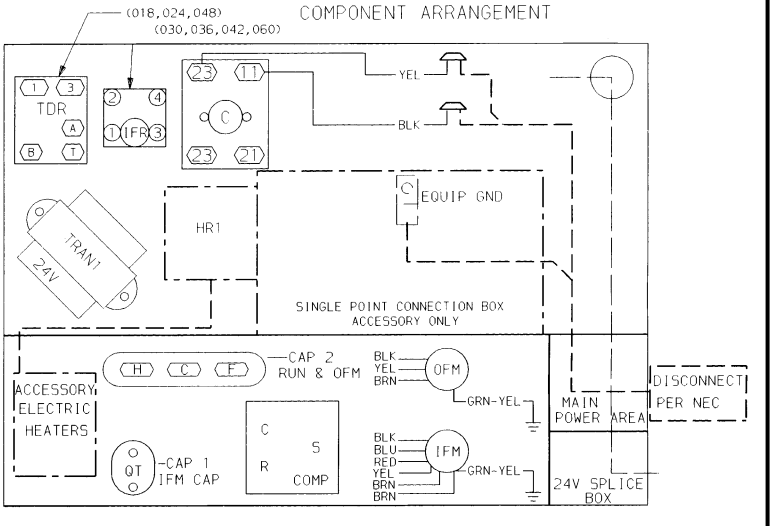


LEGEND

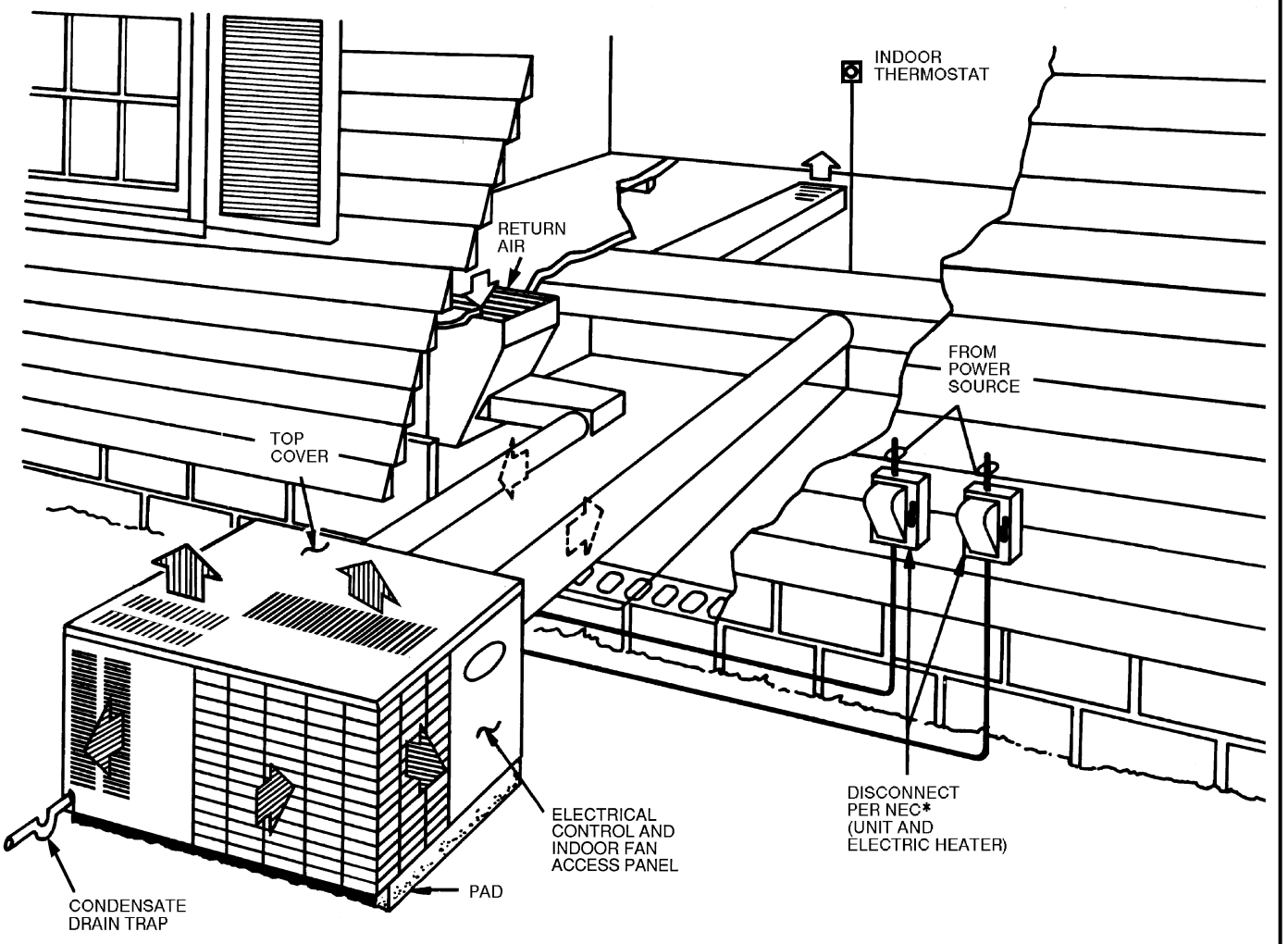
AWG	—	American Wire Gage
C	—	Contactor, Compressor
CAP	—	Capacitor
CH	—	Crankcase Heater
COMP	—	Compressor Motor
EQUIP	—	Equipment
FU	—	Fuse
GND	—	Ground
HR	—	Heater Relay (Strip Heat)
IFR	—	Indoor-Fan Relay
IFM	—	Indoor Fan Motor
NEC	—	National Electrical Code
OFM	—	Outdoor-Fan Motor
QT	—	Quadruple Terminal
TDR	—	Time Delay Relay
TRAN	—	Transformer

- Field Splice
- Marked Wire
- Terminal (Marked)
- Terminal (Unmarked)
- Terminal Block
- Splice
- Factory Wiring
- Field Control Wiring
- Field Power Wiring
- Accessory or Optional Wiring
- To indicate common potential only, not to represent wiring

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. Set heat anticipator at .26 amp for 1st stage and .26 amp for 2nd stage.
3. Use copper, copper-clad aluminum, or aluminum conductors.



Typical installation



*Separate disconnect per NEC (National Electrical Code) required for electric heater when single-point connection is not used.

Packaged Rooftop Cooling Unit with Electric Heat — Constant Volume Application

HVAC Guide Specifications

Size Range: **1½ to 5 Tons, Nominal Cooling**
Carrier Model Number: **50SS**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor rooftop/slab mounted, electrically controlled cooling unit utilizing a reciprocating, rotary, or scroll compressor for cooling duty and optional electric heaters for heating duty. Unit shall discharge supply air downward or horizontally as shown on contract drawings.

Outdoor fan/coil section shall have a blow-thru design for minimum sound levels.

1.02 QUALITY ASSURANCE

A. Unit shall be rated in accordance with ARI Standards 210/240-89 and 270-84. Designed in accordance with UL Standard.

B. Unit shall be UL listed and CSA certified as a total package for safety requirements.

C. Roof curb shall be designed to conform to NRCA Standards.

D. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled single piece cooling unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

B. Unit Cabinet:

1. Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated pre-painted steel.
2. Indoor blower compartment interior cabinet surfaces shall be insulated with a minimum ½-in. thick, flexible fiberglass insulation, coated on the air side with aluminum foil.
3. Cabinet panels shall be easily removable for servicing.
4. Unit shall have a factory-supplied condensate trap.
5. Unit insulation conforms to ASHRAE Standard 62P.

C. Fans:

1. Indoor blower (Evaporator Fan)
   a. Fan shall be 2- or 3-speed direct drive as shown on the equipment drawings.
   b. Fan wheel shall be made from steel, be double inlet type, have forward curved blades with a corrosion resistant finish, and be dynamically balanced.
2. Outdoor (condenser) fan shall be of the direct-driven propeller type with aluminum blades riveted to corrosion resistant steel spiders. It shall be dynamically balanced, and discharge air vertically upwards or horizontally.

D. Compressor:

Fully hermetic; reciprocating, rotary, or scroll type with internal and external vibration isolation.

E. Coils:

1. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
2. Tube sheet openings shall be belled to prevent tube wear.

F. Refrigerant Components:

Refrigerant components shall be of the Acutrol™ feed system type.

G. Filter Section:

Filter section shall consist of field-installed, throwaway 1-in. thick fiberglass filters of commercially available sizes.

H. Controls and Safeties:

1. Unit Controls:

   Unit shall be complete with self-contained low-voltage control circuit.

2. Safeties:

   Compressor shall incorporate a solid-state compressor protector which provides reset capability at the space thermostat.

I. Operating Characteristics:

1. Unit shall be capable of starting and running at 115 F ambient outdoor temperature per maximum load criteria of ARI Standard 210-89.
2. Compressor with standard controls shall be capable of operation down to 40 F ambient outdoor temperature.

J. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

K. Motors:

1. Compressor motors shall be of the refrigerant cooled type with line break thermal and current overload protection.
2. All fan motors shall have permanently lubricated bearings, and inherent automatic reset thermal overload protection.
3. Outdoor (condenser) fan motor shall be totally enclosed.

L. Special Features:

1. Roof Curb:
   a. Formed 16-gage galvanized steel with wood nailer strip and capable of supporting entire unit weight.
   b. Allows for installing and securing ductwork to curb prior to mounting unit on the curb.

2. Modulating Economizer:
   a. Economizer controls capable of providing free cooling using outside air.
   b. Equipped with low-leakage dampers not to exceed 3% leakage, at 1.0 in. wg pressure differential.
   c. Spring return motor shuts off outdoor damper on power failure.
3. Manual Damper:

   Manual damper package shall consist of damper, birdscreen, and rainhood which can be preset to admit outdoor air for year-round ventilation.
4. Low Ambient Package:

   Package shall consist of a solid-state control and condenser coil temperature sensor for controlling outdoor-fan motor operation, which shall allow unit to operate down to 0° F outdoor ambient temperature.
5. Heating Section:
   a. Equipped with field-installed electric resistance heater(s) of the characteristics shown in the equipment schedule.
   b. Heater elements shall be open wire type, adequately supported and insulated with ceramic bushings.
   c. Electric heater packages must provide single-point power connection capability.
6. Time Guard® II Device:

   Solid-state control shall protect compressor by preventing short cycling.
7. Lifting Bracket Kit:

   Kit shall provide attachment points for rigging straps. (Not required when unit is equipped with an optional base rail.)
8. Filter Rack:

   Filter rack shall provide for internal mounting of filters in vertical applications.
9. Two-Position Dampers:

   Allows outside air to enter the building when the indoor fan is energized.
10. High and Low Pressure Switch Kits:

    Kits shall protect unit from operating at unacceptable pressures.
11. Duct Cover Kit:

    Covers horizontal ducts after unit has been converted to downflow discharge.
12. Rectangular Duct Connection Kit:

    Allows easy conversion from round to rectangular ducts.
13. Outdoor Thermostat:

    Allows for staging of electric heaters based on outdoor-air temperature.
14. Crankcase Heater:

    Warms crankcase oil to reduce refrigerant migration and ensure proper compressor lubrication.
15. Thermostat and Subbase:

    Provides staged cooling and heating, automatic (or manual) changeover, fan control.
16. Electronic Programmable Thermostat:

    Thermostat provides 2-stage heating and 2-stage cooling control with remote communication ability.
17. Base Rail:

    Base rail provides holes for rigging and handling; frame provides elevating and support for horizontal applications.

Manufacturer reserves the right to discontinue or change at any time, specifications or designs without notice and without incurring obligations.